CURVED KEYBOARD

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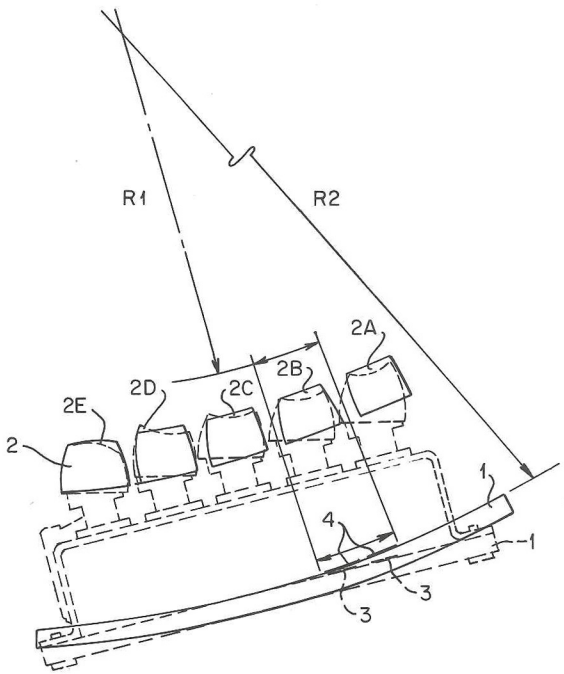

It is well known in keyboard designs that the profile or geometry of the arrangement of keytops relative to an operator's hand should have an effective dish or curved shape to enhance the operator's ease of access and feel for the keytops. A flat, slanted keyboard having key buttons of identical shape and identical keytop orientation may cause operator discomfort because of the lack of any curved or dishing effect produced along the various planes of the keytops.

This problem has been alleviated in prior designs by using individually shaped key buttons or keystems which vary as to the slant and

degree of slope molded into the top of the key buttons by the row in which they are used in the assembled keyboard. This approach creates the desirable dished or curved effect for the operator. It also creates an assembly problem, since individual key buttons or keystems must be designed for each row where they are intended to be used. This fact, combined with the wide variety of font and key top designations which are required, multiplies the inventory of marked key button tops appreciably and complicates the assembly process by requiring careful selection among several keytops with the same nomenclature on them depending on the row in the keyboard in which they are to be used.

The figure illustrates another solution to the problem in which the desirable dished or curved profile is created, not by altering the keytop design, but by bending the entire keyboard itself to create the curved keytop orientation. By this approach, the key buttons may all be of the same cross section and slant, and only the nomenclature need be changed. Special keys are not required depending upon the row in which they are used.

In the figure, the substrate or circuit board 1 is illustrated in dashed lines and in solid lines. The circuit board 1, as illustrated in dashed lines, represents the flat surface board utilized previously. The keyboard 1 shown in solid lines illustrates the same substrate or circuit board, but with the circuit board bent or deformed into an arc of radius R_2. This has the effect of creating a curved or dished profile across the radius R_1 for the keytops, and permits the design of the keytops to be identical regardless of the row in which they are employed.

Keytops 2A, 2B, 2C, 2D and 2E illustrate, in dashed lines, the varying curvatures and keytop designs which were utilized in the past to create the dished effect for noncurved circuit boards or substrates. The solid lines for the keys 2 show that the keytops may all be of the same profile but that the effective curvature R_1 is still achieved with the curved substrate or circuit board configuration. An additional advantage is that, with capacitive coupling technology, the capacitive pads 3, which are normally employed on the flat circuit board 1, are of increased area, as illustrated by the exaggerated key pads 4, since the arc of curvature in the curved configuration for the curved substrate 1 has a greater expanse then the flat configuration for the capacitive pads 3 in the flat circuit board embodiment.